COLITIS *

Z. T. BERCOVITZ

Assistant Clinical Professor of Medicine, New York Post-Graduate Medical School (Columbia University), Instructor in Medicine, Cornell Medical School, New York, N. Y.

COLITIS has been used loosely to cover all conditions of dysfunction of the bowel. This is erroneous. The term "colitis" specifically refers to inflammatory lesions of the colon. It does not include the various forms of bowel dysfunction in which there is no inflammation.. It should be pointed out that while dysfunction often is manifested in inflammation of the bowel, not all dysfunction is associated with or caused by inflammation. It is suggested that the term "colitis" be reserved for only those lesions of the colon in which there is inflammation.

DIFFERENTIAL DIAGNOSIS

The differential diagnosis of inflammatory lesions of the bowel involves a clear-cut understanding of the difference between bowel dysfunction, which is not associated with any pathological changes, and lesions of the colon, which are either specific or non-specific in character.

It has been shown by Bercovitz,[1,2,3] in a series of studies on cellular exudates of bowel discharges, that the mucus or bowel evacuations from a healthy colon contain no significant cells. On the other hand, the presence of cells of various types, especially polymorphonuclear leukocytes, round cells and macrophages, is indicative of pathological changes, even though these may not be visualized through the sigmoidoscope or in roentgen-ray films made with contrast media.

The best way to obtain specimens for examination is to give three saline enemas to cleanse the bowel of fecal matter. The mucus or other material evacuated about one hour after the last enema is then examined. The mucus should be examined immediately after passage first on the warm stage for evidence of motile amebae, and then by means of Loeffler's methylene blue wet preparations for the study of cellular

* Read before the Friday Afternoon Lecture Series, New York Academy of Medicine, December 6th, 1946.

elements. The patient with simple bowel dysfunction has no cellular exudate.

Inflammatory lesions of the bowel which enter into the differential diagnosis of "colitis" may be classified as follows:

I SPECIFIC

Bacterial (Shigella group (bacillary dysentery), cholera, and other organisms whose role is not clearly understood, such as various streptococci and Escherichia coli)

Protozoan (Endamoeba histolytica, Endolimax nana, Balantidium coli, Girardia lamblia and Plasmodium falciparum)

Helminthic (Schistosoma mansoni, S. japonicum)

Virus Infections (Lymphopathia venereum)

II NON-SPECIFIC

Chronic Ulcerative Colitis (cause unknown)

Diverticulitis

Ileitis (regional, terminal ileo-colitis)

Nutritional Deficiencies

III OTHER CONDITIONS TO BE RULED OUT

Psychosomatic

Malignancy of the Gastrointestinal Tract

Gastric, gall bladder or pancreatic disease, and diseases of the genito-urinary tract

General Management of Colitis

The management of inflammatory disease of the bowel includes not only specific therapy, when indicated, but also treatment of the patient as a whole. The success of any program of therapy will depend upon the extent to which each of these is carried out.

In the general management of the colitis patient, psychosomatic factors and the nutritional state of the patient should be evaluated.

Since it is often impossible to state with certainty to what extent the psychogenic factors are responsible for the colitis and resulting bowel dysfunction, it is of the greatest importance that the patient and his problems be carefully evaluated and every effort made to establish a definite anatomical diagnosis. It is unfair to both the physician and the patient to make the diagnosis of psychoneurosis without prolonged painstaking investigations in order to establish the correct diagnosis. Consultations with other physicians, who have not seen the patient

previously and are therefore not too strongly aware of the psychoneurotic factors, are helpful.

The colitis patient cannot be treated casually or in a hurry. It may require weeks or months of observation before the true nature of the disease manifests itself. The physician must take time to understand his patient and win his confidence. It is only by carefully observing his patient, listening sympathetically to his story and encouraging him to release his worries and cares, that the physician can win his patient's confidence to be rewarded ultimately by being able to make a diagnosis. Often there are social aspects, intimate family and marital problems, financial difficulties, and even small worrysome matters, which are related to the problem, and it is a great comfort and benefit to the patient to know that the attending physician is concerned, understands and is anxious to help.

The physician should under no condition tell the patient that he is psychoneurotic, but rather should reassure him that his complaints are quite normal. It should be remembered that any patient who has diarrhea, pain in the abdomen, with loss of weight and strength over a period of time, is bound to become neurotic and distressed over points which would ordinarily be insignificant. Furthermore, the physician should be aware that the psychoneurotic manifestations of bowel disease are frequently the first indication that there is anything wrong with the patient.

Every patient with bowel dysfunction should be given proper treatment, even though the symptoms appear to be purely psychosomatic in origin. This is imperative, since the various types of bowel dysfunction are frequently the precursors of bowel diseases. Therefore, if the physician bears in mind that his patient with bowel dysfunction is a candidate for actual gastrointestinal pathology, including inflammatory changes and malignant degeneration, many of the late effects may be eliminated.

The general nutritional condition of the patient is the second important factor to be considered in the management of colitis. This includes careful evaluation of fluid balance, proteins, carbohydrates and vitamins. These apply not only to the acute dysenteries and diarrheas, but also to chronic conditions, especially chronic ulcerative colitis.

The therapeutic indications are for a minimum of 2500 cc. of fluids in 24 hours. This should be given by intravenous infusion for the first

day or two in cases of acute diarrhea. The use of 5 per cent glucose in normal saline is most acceptable, and in most instances 500 cc. of plasma should be given at least once during the day. To each infusion of 1000 cc. may be added 100 mg. thiamine chloride, 100 mg. niacinamide and 1000 mg. ascorbic acid. This program of fluid administration should be carried on simultaneously with specific therapeutic agents.

Whole blood transfusions are of great value both in patients with acute and chronic diarrhea, and in patients with inflammatory disease of the bowel, such as acute or chronic bacillary or amebic dysentery and chronic ulcerative colitis.

Dietary in the acute and chronic inflammatory diseases of the bowel has been a subject of great controversy in the past few years. For a long time it was the consensus that every consideration should be toward maintaining a non-irritating diet and to provide food which does not have any residue or roughage in order to put the bowel at rest and thus reduce the number of bowel movements in the day.

The patient with an inflammatory disease of the colon has bowel movements of blood, mucus and pus because of the inflammation, especially of the rectum and sigmoid, and not simply because of the food he may eat. Food taken into the stomach will provoke a defecation reflex as a purely physiological reaction. This is shown in cases in which ileostomy or colostomy has been performed. It is not the irritation caused by any single food, but the inflammation of the bowel which causes the diarrhea. This mechanism of the defecation reflex should be carefully explained to the patient so that he will not fear eating and will cease attributing every desire to evacuate the bowels to the foods taken into the stomach.

The dietry indications in acute and chronic inflammatory diseases of the bowel are for a full, balanced diet, particularly rich in proteins and vitamins. The foods should be prepared and served attractively, with every effort made to approach the normal diet. The practice of serving all foods in pureed form is unfortunate. Giving the patient food he can chew helps both psychologically and physiologically. More than ten years of experience in following this practice has proved it is without harm to the patient. Moreover, patients state that they feel better and have less abdominal distress when maintained on a liberal diet.

The only contraindications in diet are highly spiced foods and members of the cabbage and onion families. Food should be prepared simply,

well cooked and flavored to the patient's taste. It is best to give frequent small feedings, each containing an adequate amount of highly nutritious food.

Hydrochloric acid has been found of great value as a digestive aid. A dose of 30 minims in one-half of a glass of water after each meal is indicated. Other drugs, except as specifically indicated in the various infections, are generally contraindicated. Opiates give slight, but very temporary relief, and have the disadvantage of being habit-forming. Most patients state that while the opiates give some relief in the number of evacuations, there is distention, abdominal distress, and ultimately profuse movements which leave the patient weaker than if the drug were not given. Sedation with small dosages of barbiturates is indicated in highly nervous patients, and such preparations as syntronal, belladonal and bellergal seem to give relief and comfort at times.

Vitamin preparations are of value, and the selection should be based on potency and palatability. Parenteral injection is indicated wherever there is a question about absorption from the gastrointestinal tract. This is the method of choice during the acute stages.

Specific therapy, wherever indicated, will be considered under the various types of bowel inflammation.

Bacillary Dysentery (Colitis)

Bacillary dysentery (colitis) is an acute inflammatory disease of the large bowel caused by one of the Shigella group of organisms. The intensity of the infection and the clinical picture varies within wide limits, depending partly upon the virulence of the infecting organism and upon the resistance of the patient at the time of the infection.

The usual clinical picture is outstanding and characterized by the sudden onset of diarrhea with straining, tenesmus, blood, mucus and pus. The patient is toxic, feverish, and has bowel movements numbering 20, 30 or more a day. The patient is literally glued to the bedpan, and after great effort expels only a small amount of mucus and pus which stick to the bedpan.

On sigmoidoscopic examination, the bowel is found to be inflamed, necrotic, with definitely ragged ulcerations usually in the transverse axis of the bowel. Heavy, purulent, mucoid material is present, which on microscopic examination shows a heavy cellular exudate of polymorphonuclear leukocytes, denuded epithelial cells and macrophage cells

—all with ringed nuclei and with many toxic granules. It is possible to make a presumptive differential diagnosis between amebic and bacillary dysentery on the basis of cellular exudate studies. Cultural examinations made early in the disease directly from the ulceration will usually yield organisms of the Shigella group.

The therapeutic indications in bacillary dysentery (colitis) are twofold: namely, specific to eradicate the causative Shigella organism, and general systemic to improve the general condition and comfort of the patient.

Specific therapy involves the use of one of the sulfonamide drugs. Sulfaguanidine has been shown to have a specific therapeutic action in bacillary dysentery; but sulfadiazine, used in various parts of the world where sulfaguanidine was not available, was found to have an equally specific action. In fact, in the author's experience in India, sulfadiazine became the drug of choice, and the response noted was as dramatic as that obtained with sulfaguanidine and equally as specific.

The recommended dosage of sulfaguanidine in the treatment of acute bacillary dysentery is 3 or 4 grams initially, followed by 2 grams every three hours day and night for the first 24 hours or until the bowel movements become less frequent, the straining and tenesmus are relieved, and there is a passage of fecal material. After the first 24 hours, the midnight dose may be omitted. It has been found that by the end of the second day the patient will have made sufficient progress to warrant reduction of the dose to 1 gram every four hours. This dosage should be continued for at least four or five days even though the patient appears to be symptom free.

Most noteworthy in the author's wartime experience with bacillary dysentery was the fact that patients made dramatic recoveries, as evident from symptomatological improvement and sigmoidoscopic findings, but did not have the tendency to develop chronic ulcerative colitis, as previously seen so frequently after bacillary dysentery infection. It was found that after a week of sulfaguanidine or sulfadiazine, proctoscopic examination revealed an entirely normal bowel mucosa with negative cellular exudate on study of the bowel discharges.

The general systemic approach to the treatment of bacillary dysentery is equally as important as the specific chemotherapy. The patient should be given by intravenous infusions 5 per cent glucose in normal saline. To each 1000 cc. may be added 100 mg. thiamine chloride, 100

mg. niacinamide and 1000 mg. ascorbic acid. A minimum of 2000 cc. should be given intravenously until the patient is able to take adequate fluids by mouth. In addition, 500 cc. of plasma should be given intravenously during the first 24 hours, making a total of 2500 cc. of fluid injected the first day of treatment. Sedatives of the phenobarbital group may be administered, but the opiates, including paregoric, tincture of opium, are not only unnecessary but contraindicated. In most instances the patients appear more toxic and have more abdominal distress after the opiates. The response to sulfaguanidine or sulfadiazine is so prompt and effective that the opiates are unnecessary.

The diet should be high in proteins and vitamins, and the patient should be encouraged to eat solid foods and take fluids by mouth at the earliest possible moment. This is most important, since the patient with profuse diarrhea, is losing proteins and vitamins which must be replaced. If it is remembered that the bowel movements are caused by the inflammation of the sigmoid and colon, and not by the food the patient eats, many patients will be saved from starvation, which often results because proteins and vitamins are not replenished as they are lost.

Amebic Dysentery (Colitis)

Amebic colitis is caused by an infection with Endamoeba histolytica. In its simplest form, there is typical ulceration with a normal mucosa surrounding. The amebic colitis may be either acute or chronic. In the acute stages the symptom picture is quite characteristic, with diarrhea amounting to 4, 6 or 8 bowel movements in 24 hours and with no straining nor tenesmus. The patient is only moderately ill, and is not as toxic as in bacillary dysentery; generally there is no fever. The bowel movements are usually copious and may or may not contain visible mucus and blood.

In those cases in which the infection has persisted for a considerable length of time and has become chronic, the clinical picture varies within very wide limits, and it is quite impossible to describe a so-called typical or classic picture of chronic amebiasis. There may be alternating diarrhea and constipation, some flatulence with more or less gas, and vague abdominal pains are frequently present which makes the patient conscious of his abdomen. Constipation is not an infrequent symptom of amebiasis; in fact, there are a great many patients who claim that they have never had an attack of diarrhea but have suffered only from con-

stipation.

The diagnosis depends upon finding the typical forms of E. histolytica in specimens of the stool or other bowel discharges. In making the diagnosis, the various concentration tests should be used, especially the Faust centrifugal flotation with zinc sulphate or Otto's modification of the technique. If these methods fail to reveal amebae, then the patient should be given saline enemas, and freshly passed mucus examined for amebae. The patient also may be given a dosage of Epsom salts, and the stools passed in the laboratory so that they can be examined fresh and warm.

In evaluating the mucus specimens, it should be remembered that there are many cells which come down in the bowel discharges and which may be confused with E. histolytica. These are most frequently macrophages, polymorphonuclear leukocytes, epithelial cells and plasma cells, and cause confusion especially in freshly passed, unstained material. Cells of tissue origin should be carefully identified to avoid mistaking them for E. histolytica. Ofttimes chronic ulcerative colitis, carcinoma of the colon, especially the rectum or sigmoid, and lymphogranuloma are treated as chronic amebiasis and the real nature of the condition missed until it is too late to help. To avoid such instances of mistaken diagnosis, the findings should be confirmed by those qualified in the differential diagnosis, especially by fixed stained preparations.

It should be pointed out that there are cases of chronic amebiasis of long duration in which it may not be possible to demonstrate forms of E. histolytica in the stools. This is particularly true of some of the complications of amebiasis, such as amebic granuloma, amebic hepatitis and amebic typhilitis. In these instances the diagnosis must be made on the basis of clinical history, physical findings and the response to specific therapy with emetine.

Sigmoidoscopic examination may show only a moderate degree of atrophy of the bowel mucosa; occasionally, there may be typical amebic ulcerations; or there may even be a normal rectum and sigmoid with the lesions being present higher up in the bowel. There may be secondary bacterial infection of the bowel such as in bacillary dysentery, in which case the sigmoidoscopic picture is that of the acute process.

The complications of amebiasis have been outlined by Bercovitz[4] and include secondary bacterial infection of the amebic ulcerations, perforation of the bowel, amebic hepatitis with or without abscess for-

mation, amebic granulomata especially of the sigmoid or cecum, amebic appendicitis, typhilitis, and the more uncommon complications of amebic abscess of the spleen following perforation of the splenic flexure of the colon, and amebic abscess of the brain and lungs. Amebic abscess of the prostate has been seen.

The therapeutic approach to the problem of amebic colitis and its complications must include a careful evaluation of the patient as a whole and treatment of the patient, and not only his parasites. It should be remembered that in more than 90 per cent of the cases of acute amebiasis studied there is some secondary bacterial infection of the bowel, and in about 50 per cent there is evidence of amebic hepatitis. Thus every patient should be carefully studied for evidences of secondary infection, such as cellular exudates in the bowel discharges in amebiasis, liver tenderness, thickening of the bowel over the cecum or descending colon and sigmoid area.

Table I is taken from a recent article by Bercovitz[4] and summarizes the drugs most commonly used in therapy of amebiasis.

Emetine is the most valuable drug in amebiasis, and is indicated in both the acute and chronic stages of infection, as well as in complications. Where the infection is of long duration the parasites tend to get deep into the tissues, and in such cases emetine in addition to oral medication is indicated. In cases of failure, it is not a question of the parasites being "emetine-fast," but rather a problem of secondary bacterial infection which makes it impossible for the drug to reach the parasites. The same applies to other drugs used in the treatment of amebiasis.

On the basis of the author's experience, the following course of therapy has been found most acceptable and results in complete eradication of the infection. A course of emetine is given simultaneously with a course of sulfadiazine for seven days. This is then followed by a course of 200 tablets of diodoquin. The sulfadiazine may then be repeated once and followed again by the diodoquin. Diodoquin is the drug of choice in that it causes the least amount of irritation with highest efficiency. The most important point to remember is that the dosage must be adequate. Therefore, a dosage of 200 tablets given in doses of 4 tablets four times daily (16 tablets for the total daily dosage) is used. Under this program there have been no failures.

TABLE I—TREATMENT OF AMEBIC DYSENTERY‡

Drug	*Single Dose*	*Number of Doses Daily*	*Total Daily Dosage*	*Total Dosage of Single Course of Treatment*	*Indications*
Emetine hydrochloride*	½ gr. (0.032 Gm.) Subcutaneously	2 (a.m. and p.m.)	1 gr. (0.0065 Gm.)	7 gr. (0.455 Gm.)	Acute and chronic amebiasis, amebic granuloma, hepatitis, typhilitis perforations
Diodoquin Tablets of 3.2 gr.	4 tablets	4 (four times a day after food and bedtime)	16 tablets (3.84 Gm.)	200 tablets (64.00 Gm.)	Acute and chronic amebiasis with trophozoites and cysts of E. histolytica
Chiniofon Tablets of 0.25 Gm. each.	2-3 tablets	3 (three times a day after food)	6-9 tablets (1.5-2.25 Gm.)	100 tablets (2.50 Gm.)	Chronic amebiasis, cyst passers
Vioform Tablets of 0.25 Gm. each.	3 tablets	3 (three times a day after food)	9 tablets (2.25 Gm.)	100 tablets (25.0 Gm.)	Acute and chronic amebiasis with cysts of E. histolytica
Carbarsone† Capsules of 0.25 Gm. each	1 capsule	2 (a.m. and p.m.)	2 capsules (0.5 Gm.)	20 capsules (5.0 Gm.)	Chronic amebiasis, with cysts

* Myocardial poison—give subcutaneously only. Never to be given by intravenous or intramuscular injection. Blood pressure and pulse should be checked before each injection. Patient should be kept at bed rest if possible.

† Carbarsone is an arsenical and should not be used in any cases suspected of liver damage, such as amebic hepatitis.

‡ Reproduced by permission of the New York State Journal of Medicine.

Chronic Ulcerative Colitis

Etiology: The etiology of chronic ulcerative colitis is still obscure, despite the large number of studies made. An extensive analytical review of the literature on the etiology of chronic ulcerative colitis published by Ginsberg and Ivy,[5] revealed that there is no single etiological factor responsible for all cases.

Chronic ulcerative colitis as a disease entity may follow many disease conditions. Amebic and bacillary dysentery have been followed by this disease; indeed, there are certain cases in which these infections might seem to be the precipitating agents. Undoubtedly emotional and psychogenic factors are concerned, but it is difficult to attribute sole cause to them. There have been many instances in which great emotional and psychological upsets have been attended by attacks of diarrhea with dysfunction of the bowel, and in such instances when the condition persists over a long period of time, it is conceivable that permanent bowel damage may occur.

Although the causative agent in chronic ulcerative colitis has not been established, it is essential to conduct prolonged and intensive investigation of all the possible factors and to give the patient the benefit of the various specific therapeutic measures available.

Complete investigation of cases of chronic ulcerative colitis involves repeated careful microscopic examination of exudates both before and after saline enemas for amebae, cellular exudate studies with Loeffler's methylene blue, sigmoidoscopy to rule out malignancy, cultures of mucus and bowel discharges for pathogenic microbes, and finally, roentgen-ray examination of the colon with the barium colon enema. In addition to these, it is essential to make gastric analyses and to determine plasma ascorbic acid, prothrombin clotting time, plasma proteins and glucose tolerance. These studies will in many instances give the therapeutic indications for the patient as a whole.

Treatment: Treatment of chronic ulcerative colitis consists of two parts, much in the same way as that of treating other forms of colitis: (1) treatment of the patient as a whole, and (2) treatment directed against the specific infection of the bowel.

As previously stated, psychological and emotional factors must be considered in the management of chronic ulcerative colitis as they are in other forms of colitis. The patient who has chronic diarrhea, ab-

dominal pains, anorexia, nausea, and the general debility which goes with the disease, is also affected psychologically and becomes emotionally unstable.

Patients with chronic ulcerative colitis must be understood to be helped. It is imperative that under no circumstances are they made to feel that they are mental cases. They should be encouraged and repeatedly told that they will be cured and be normal again. Every sign of encouragement should be stressed, even if it is temporary, and the physician should never display his discouragement. The family physician must employ practical psychotherapy. The patient should be given time to talk and ask questions, each of which should be answered whenever possible.

In addition to creating mental rest and peace of mind in his chronic ulcerative colitis patient, the physician should employ physical rest and relaxation. Narcotics and habit-forming drugs should be avoided. Opium has been a favorite drug to reduce bowel movements, but it is ineffective except as a temporary measure and has the disadvantage of becoming habit-forming. Many a patient with chronic ulcerative colitis has become an addict because of the unfortunate use of forms of opium. This practice should be eliminated. The barbiturates are much more satisfactory, but they, too, may be habit-forming. No matter what drug is used for sedation, it is important not to continue it for too long a period.

Nutrition and Diet: Maintenance of proper nutrition of the patient is the major problem confronting the physician treating a case of chronic ulcerative colitis. It must not be forgotten that the patient has a diarrhea and moves his bowels with blood, mucus and pus because he has an inflammation of the bowel, especially of the recto-sigmoid area, and that he does not move his bowels because of the food taken into his mouth and swallowed which may evoke a defecation reflex.

The physician should be prepared to dispel the erroneous belief of many patients that because they have diarrhea following any single meal it is to be attributed to the food consumed. This is important to ward off the ill effects of elimination of essential foods from the diet, when there is no just cause other than the patient feels it is the food he eats that causes the diarrhea.

The practice of giving perfectly bland diets to remove all roughage from the colon has not cured the inflammatory lesions of chronic ulcera-

tive colitis. In fact, it has been noted that even when an ileostomy has been performed and the colon put entirely at rest in so far as fecal matter is concerned, the patient still passes blood, mucus and pus from the rectum because of the inflammation present.

There is ample evidence to show that patients with chronic ulcerative colitis are soon depleted of their reserves of proteins, vitamins and other essentials for nutrition and tissue repair. The therapeutic indications, therefore, are for an adequate, liberal diet with enough proteins, carbohydrates and vitamins to replenish the losses suffered from the disease and the diarrhea. It should be remembered also that the patient with chronic ulcerative colitis does not absorb adequate amounts of food even though it is not possible to demonstrate roentgenologically any lesions of the small bowel. Thus the nutritive content of his diet must be increased to replace his losses and to make up for the poor absorption of whatever food he does take in. It has been proved by experience that patients who take an adequate amount of food, not only feel better and are stronger, but they do not have as much abdominal distress.

The diet in chronic ulcerative colitis cases should include adequate amounts of proteins, especially meats. These should be dictated by the taste and desires of the patient. Beef steaks, roasts, chopped meats, boiled or broiled, and tastily served are excellent sources of essential proteins, and should form the basis of any chronic ulcerative colitis diet. Vegetables and fruits in keeping with the patient's likes and dislikes should also be served.

All food should be properly prepared and special attention should be given to serve the menu attractively, to stimulate the patient's appetite and desire for food. It has been a common experience that a patient will tolerate and eat many vegetables which are cooked and served in natural form, but will become nauseated at the sight of puréed spinach with butter, or other puréed and strained vegetables. Puréed vegetables may be disguised by using them in creamed soups, in which form they may be enjoyed; but it should be mentioned that the concept of serving puréed vegetables to prevent roughage and thus reduce bowel movements is without scientific foundation. On the contrary, experience has shown that the patient who eats an adequate amount of meats and vegetables does better and has less pain. The same applies to simple salads such as lettuce and well-ripened tomatoes, or fruit juices such as orange and grapefruit juice. The use of a whole orange or whole

grapefruit is to be encouraged, and in many instances it has been found that the serving of grapefruit revived the appetite of the patient and stimulated his normal eating pattern.

The rule, then, in the nutritional management of chronic ulcerative colitis is the administration of high protein, high carbohydrate, high vitamin diets with intermediate feedings as often as possible, and every effort made to avoid starvation with further depletion of the body tissues.

Intravenous Fluids: Parenteral administration of body fluids, proteins and vitamins is of indisputable value, and every patient should be given the benefit of such treatment. Intravenous infusions of 500 cc. of plasma once or even twice daily are indicated in severe cases. To each infusion may be added 100 mg. thiamine chloride, 100 mg. niacinamide and 1000 mg. ascorbic acid. Blood transfusions in amounts of 250 to 500 cc. at frequent intervals are invaluable. In severe cases the use of blood and plasma daily or every other day may be absolutely necessary to save life. It has been found that even chronic cases who are not moribund, but seem to be holding their own and maintaining a stationary course in their disease, may be helped considerably by parenteral administrations.

Intravenous infusions of glucose in normal saline are also indicated to maintain fluid balance in the patient. Vitamins in the same concentrations as in plasma infusions may be added to the glucose infusion. The total amount of fluid intake in cases of chronic ulcerative colitis should be a minimum of 2000 cc. daily.

The administration of parenteral injections should be determined by the physician after careful evaluation of the patient with respect to the number of bowel movements, the quantity of material passed, the nature of the evacuations, the diet and the amount of food consumed by the patient. Ofttimes despite the fact that laboratory reports indicate seemingly adequate numbers of erythrocytes or plasma proteins, there may be need for supplementary parenteral administrations when these factors are considered.

Specific Chemotherapy: The use of specific drugs in chronic ulcerative colitis has been disappointing up until the present time. This was adequately brought out in the symposium on the use of the sulfonamides in gastrointestinal diseases held by the American Gastroenterological Association and reported recently.[6] Neither the sulfonamides, nor

penicillin, nor streptomycin has been effective in bringing about cures. This has been the experience of all those who have followed their cases for sufficient time to make careful evaluation of their results.

The sulfonamides have been used extensively. It is true that in many instances there have been what seemed to be dramatic effects following the administration of the various forms of sulfonamides, but follow-up of these patients revealed no permanent "cures." However, the temporary beneficial effects noted would warrant the continued use of the sulfonamides provided the patient is carefully observed for untoward effects of these drugs and their use is not prolonged. It should be noted that merely changing the bacterial flora of the bowel contents is not sufficient to cure a case of chronic ulcerative colitis. The causal relationship of any single microörganism to chronic ulcerative colitis has not been demonstrated adequately as yet.

Penicillin and streptomycin have given disappointing results. Some patients receiving streptomycin seem to become worse. In my experience penicillin has not given even the temporary beneficial effects sometimes seen following the administration of the sulfonamides.

Evaluation of any Form of Therapy in Chronic Ulcerative Colitis: The evaluation of any form of therapy in chronic ulcerative colitis must be made with caution. Only after a large number of patients have been studied and followed over a period of not less than five years can any statement be made regarding the value of a particular form of therapy. The need for the use of placebo therapy prior to the actual medication is of the utmost importance.

Certain criteria for evaluation of therapeutic results are necessary and the minimum standards must be rigidly followed. The criteria for cure in this disease are divided into two main groups; namely the clinical symptomatology and the objective findings of the laboratory and sigmoidoscopic examination.

Clinical evaluation of response to therapy is always concerned with the psychological response of the patient to any new medication or new system of therapy. The patient's statement concerning the number of bowel movements, the character of the stools, should be carefully weighed and studied, until they are formed, normal in size and shape, and without blood, mucus, or pus present.

The matter of sphincter control is of the greatest importance, and also the number of night evacuations. Abdominal cramps, pains and

gas should disappear. Improvement in the general well-being of the patient, as well as in his appetite and weight are other factors to be considered.

Laboratory studies should reveal a reduction in the sedimentation rate and clearing of the cellular exudates of the bowel discharges. A normal sedimentation rate and bowel discharges without cells are the fundamental objective basis for a statement of cure or improvement in any case.

Sigmoidoscopy is of value but the personal enthusiasm of the examining physician must be considered. However, if there is loss of ulcerations, clearing of the submucous hemorrhagic areas which are usually pin-point or larger in size, reduction in the edema, inflammation and thickening of the bowel mucosa, and the bowel becomes non-friable and will not bleed at the slightest contact with the sigmoidoscope when it is passed, then there is justification for an estimation of a cure. It should be pointed out that restoration of tone to the mucosa so that it is not friable is one of the last things to occur, and with it there is simultaneously a drop in the sedimentation rate and clinical improvement in the patient.

These standards represent the irreducible minimum for therapeutic evaluation in chronic ulcerative colitis. Not only must the patient be brought to this point to consider him cured, but he must remain in this condition for a minimum of five years. Otherwise it is impossible to state with certainty that the treatment was not given just at the time of a spontaneous remission, for such remissions have been observed up to five years.

Surgery in Chronic Ulcerative Colitis: The surgical indications in chronic ulcerative colitis have been stated clearly by Cave[7] and others. The more frequent use of ileostomy has been avoided because until the present time, it has been impossible to point to any considerable series of cases, in which it has been possible to reestablish the continuity of the bowel and return the patient to a normal bowel status. In most instances permanent ileostomy with its associated inconvenience has been a stumbling block. Patients therefore have been carried on a medical regime in the vain hope of reaching a period of remission which will be prolonged and that a form of "cure" will be effected.

Such practice has in most instances resulted in the patient's becoming so weak and so depleted that when finally ileostomy was considered,

the patient was in such poor condition that the surgical mortality of the operation is far out of proportion to what it should be from a purely technical standpoint. Furthermore, by the time ileostomy is considered, permanent damage to the bowel has taken place, and the pathological changes occurring may be irreversible so that the ileostomy becomes permanent with no chance for recovery of normal bowel function.

It is too early at this time, and the number of cases is too small, to predict what the end results will be of experiments now in progress in which active therapy has been undertaken of the distal loop of the bowel following ileostomy. The results observed at this time are a marked improvement in the well-being of the patient, a decline in the sedimentation rate, and improvement in the objective appearance of the bowel wall. Further reports on progress will be forthcoming.

It may be that for the benefit of the patient, ileostomy will have to be performed earlier so that active therapy can be instituted and it may be possible to reestablish continuity of the bowel in the future after healing is complete. If, however, the delay is too long and the pathological changes have become irreversible, then no means of therapy will cause healing.

Prognosis and Complications: The prognosis of chronic ulcerative colitis should always be guarded because of the complications which generally occur. These have been outlined by Ricketts and Palmer.[8] Under no circumstances is the true prognosis to be communicated to the patient or his immediate family. At all times the physician should hold out hope for eventual cure, and never display even the slightest doubt of the future lest the patient lose hope, quit fighting and die. There are thousands of cases of chronic ulcerative colitis who have become useful citizens and are performing useful functions in society even though they do not represent "cures."

The attending physician should be alert to such complications as perforations of the bowel wall. These may be minute, and as a rule are pin-point in character. They may result from the passage of infectious agents through the lymphatics to lodge in the bowel wall and cause a local area of peritoneal irritation with symptoms which point to a mild, more or less localized peritonitis.

The therapeutic indications in these cases is absolute rest in bed, the administration of one of the sulfonamides, preferably sulfadiazine, fluids by vein, and in cases where it is comforting, an ice bag.

In some instances the perforations may become larger, and actual abscesses may form along the bowel wall. These may become localized and well walled off, and under these conditions, it is better to treat the patient conservatively. If the bowel wall is so fragile that it has perforated spontaneously, the handling involved in finding the abscess and other manipulations may cause the death of the patient. Under these circumstances, there is no single surgical procedure which will cure the case, and as a rule other perforations are likely to occur. If an abscess becomes definitely localized and seems to be near to the abdominal wall, simple drainage may be considered, but even this is of great danger to the patient.

Stricture of the bowel is another complication which commonly follows a prolonged case of chronic ulcerative colitis. This may be single in the rectum or there may be multiple strictures in various parts of the bowel. When it is known that a patient has developed one or more strictures of the bowel, great caution must be observed to maintain the feces in a liquid state. If the patient is allowed to have a solid fecal mass, obstruction of the bowel will develop, which is most difficult to relieve.

It is possible to maintain a patient in good nutritional state for a period of years with two or three mushy bowel movements daily. This may be accomplished by means of carefully regulated dosages of milk of magnesia or sodium sulfate. Castor oil is contraindicated because of its constipating effect. One patient was thus maintained for eight years.

When roentgen-ray examinations of patients suspected of having bowel strictures are made, the roentgenologist should be informed so that he can use proper mixtures of barium and institute measures for elimination of the barium after the examination in order to avoid intestinal obstruction.

Carcinoma of the large bowel following chronic ulcerative colitis does occur, and has been variously reported by Cave,[9] and Ricketts and Palmer[8] and others. It would be expected that following a prolonged irritative lesion of the bowel, the incidence of cancer would be higher. On the other hand, hyperplastic changes of the bowel mucosa with polyp and pseudopolypoid changes are frequently observed in varying degree. In many instances, the entire bowel wall is involved in these changes, the process extending from the rectum to the cecum.

When this occurs, it is impossible to look forward to cure of the patient by ordinary medical measures. Such changes do not seem to progress into cancerous degenerations any more frequently than others. In a review of the available literature by Page and Bercovitz[10] it was found that among a total of 1,467 cases of chronic ulcerative colitis reported with statistics on its association with carcinoma of the colon, only 28 developed carcinoma of the colon—an average incidence of 1.9 per cent. In this connection, Swinton and Warren (referred to by Page and Bercovitz[10]) stated that they have never observed progression of the polypoid changes associated with ulcerative colitis to a malignant stage.

Helminthic Colitis and Lymphogranuloma Venereum

Helminthic colitis and lymphogranuloma venereum are dealt with briefly because they are relatively rare.

Infections with helminths, such as the various forms of Schistosoma, may be diagnosed first by consideration of the geographical location from which the patient has come, and then by careful studies of the stool for evidence of the organisms causing the infection. The specific diagnostic methods are discussed in textbooks of tropical medicine and parasitology, and more recently in publications coming from the U. S. Army Commission on Schistosomiasis. Treatment of infections with one of the forms of Schistosoma is by means of the antimony compounds, preferably fuadin.

Lymphogranuloma venereum is a specific virus infection which invades the lower bowel. It is more common in the female, but occurs also in males, especially after irregular sexual practices such as sodomy. In such cases there is usually a history of diarrhea, but on careful questioning it is revealed that the patient passes blood, mucus and pus from the rectum without any reference to the bowel movements; in fact, the patient who has had the disease for any length of time may actually be constipated as a result of the stricture which usually complicates the picture. The diagnosis is usually confirmed by proctoscopic examination, first by digital examination with notation of the stricture of the rectum within reach of the examining finger and the widely gaping anus from which there is a copious discharge of sanguinous pus and mucus. The mucosa is granular with innumerable tiny nodules, giving the finger the feel as though it were passed into a "bag of beans." The Frei test is positive.

Therapy of lymphogranuloma venereum of the rectum includes administration of the sulfonamides, especially sulfathiazole. If the stricture causes obstruction to the bowel, colostomy may have to be performed.

REFERENCES

1. Bercovitz, Z. Studies on cellular exudates of bowel discharges; control observations on 1123 patients, 7 autopsies and 3 dog experiments, *J. Lab. & Clin. Med.*, 1940, *25*:788.
2. Bercovitz, Z. Studies on cellular exudates of bowel discharges; the differential diagnosis of amebiasis. Types of cells found in bowel discharges of patients with bowel complaints, *Am. J. Digest. Dis.*, 1940, *7*:93.
3. Bercovitz, Z. Studies on cellular exudates of bowel discharges; the diagnostic significance of cellular exudate studies in chronic bowel disorders, *Ann. Int. Med.*, 1941, *14*:1323.
   Bercovitz, Z. Recent advances in the treatment of chronic ulcerative colitis, *M. Clin. North America*, 1940, *24*:683.
4. Bercovitz, Z. T. Complications of amebiasis. *New York State J. Med.*, 1946, *46*:2291.
5. Ginsberg, R. S. and Ivy, A. C.: The etiology of ulcerative colitis; analytical review of the literature, *Gastroenterology*, 1946, *7*:67.
6. Application of sulfonamides to gastrointestinol disease: Panel discussion by various authors, *Gastroenterology*, 1945, *4*:1.
7. Cave, H. W. Late results in the treatment of ulcerative colitis. *Ann. Surg.*, 1946, *124*:716.
   Cave, H. W. Surgical experiences with ulcerative colitis, *S. Clin. North America*, 1945, *25*:301.
8. Ricketts, W. E. and Palmer, W. L. Complications of chronic non-specific ulcerative colitis, *Gastroenterology*, 1946, *7*:55.
9. Cave, H. W. Cancer of the colon. *Bull. New York Acad. Med.*, 1944, *20*:255.
10. Page, R. C. and Bercovitz, Z. T. Chronic ulcerative colitis with terminal carcinoma of the transverse colon. Case report. *Submitted for publication.*